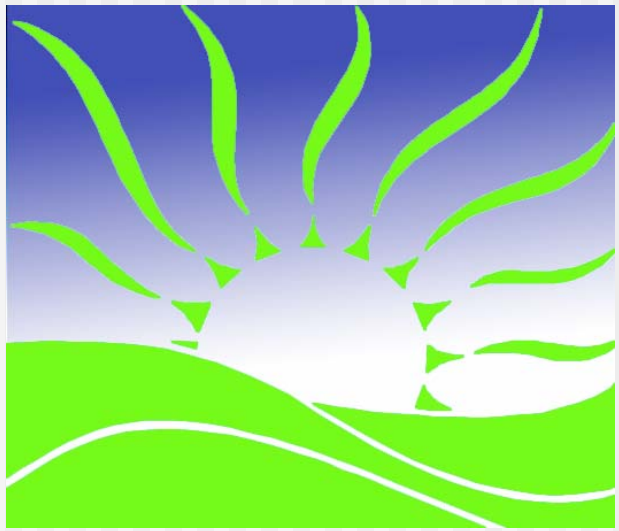
Changing a City's Climate

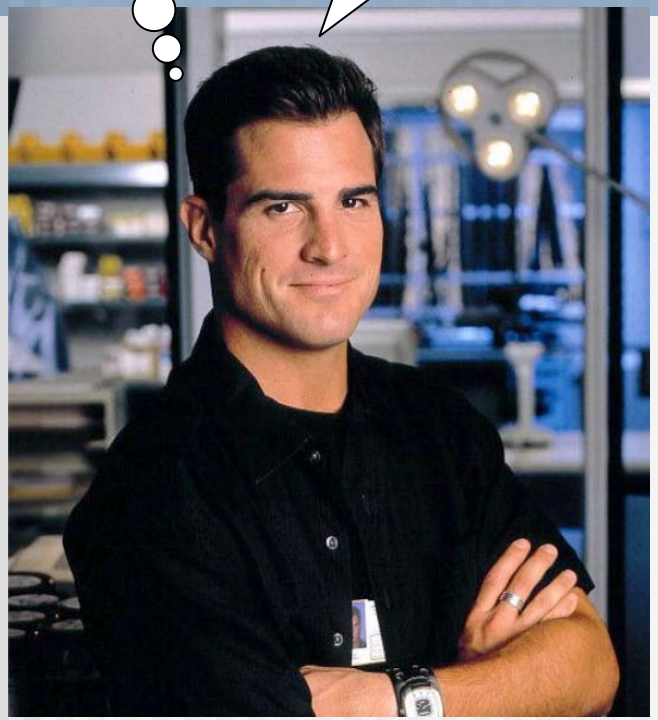


Cool Houston!

David Hitchcock, AICP
Houston Advanced Research Center

Get a life Griss!

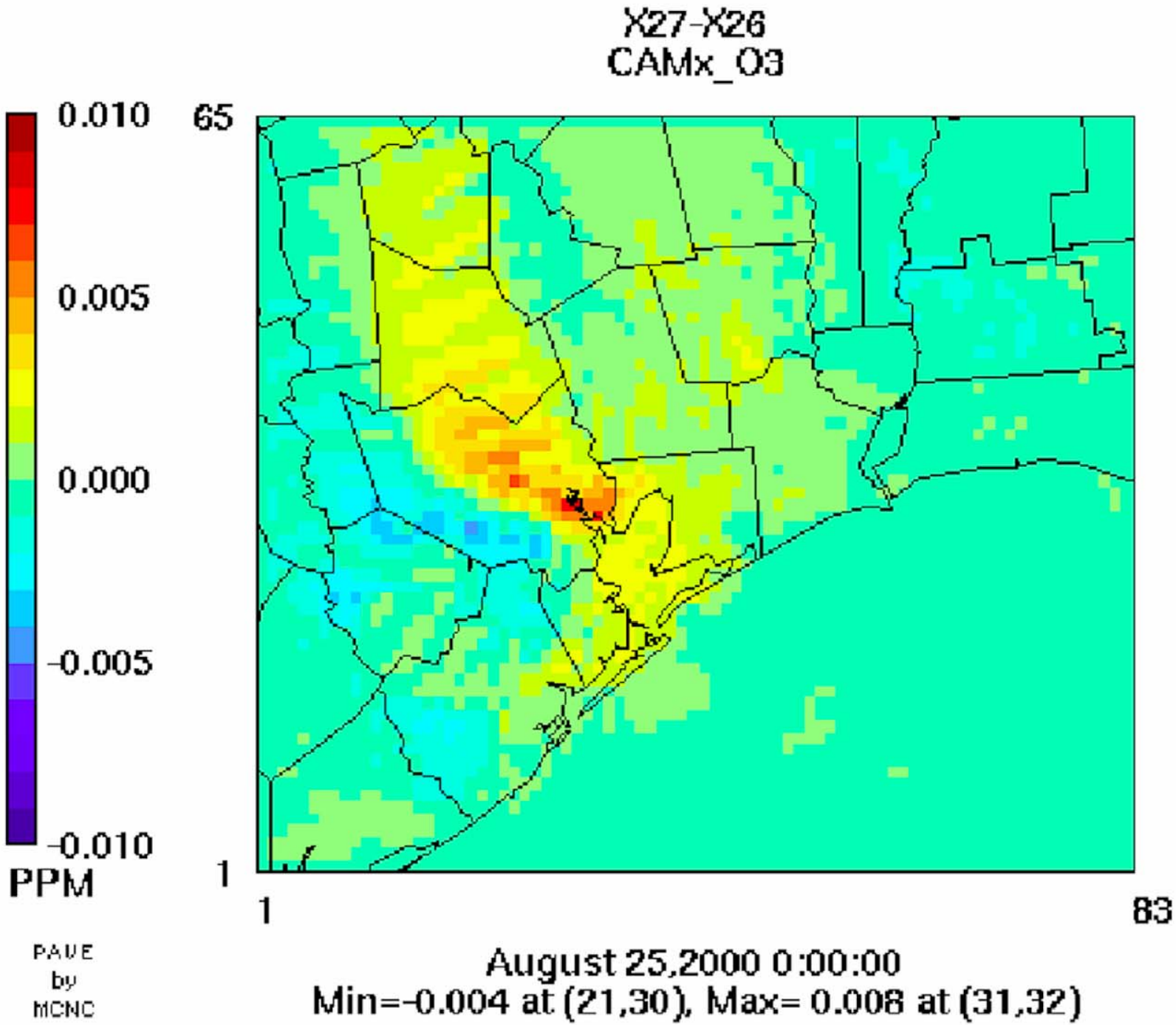
What is it?

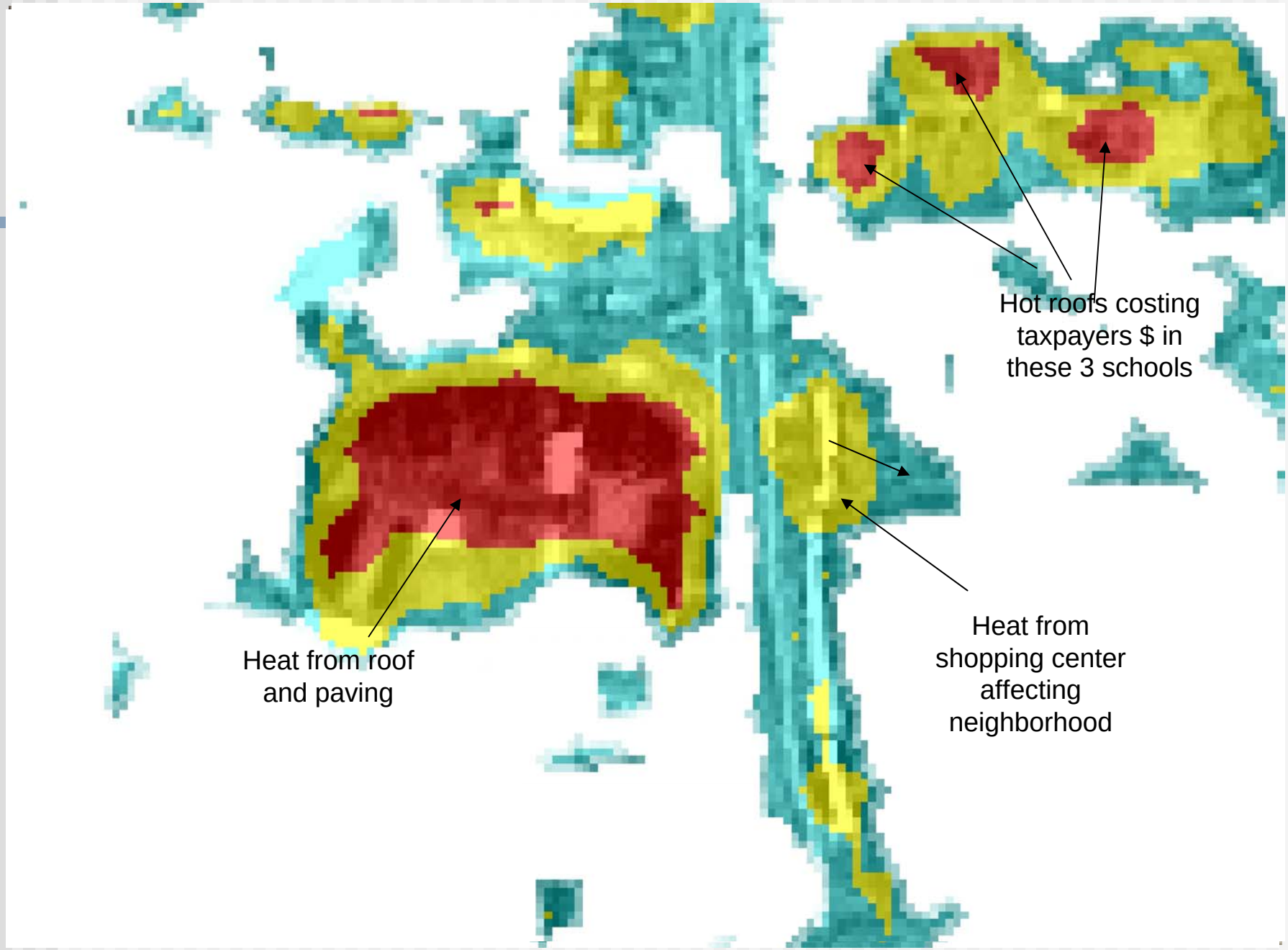


Cool roof.

Current Events

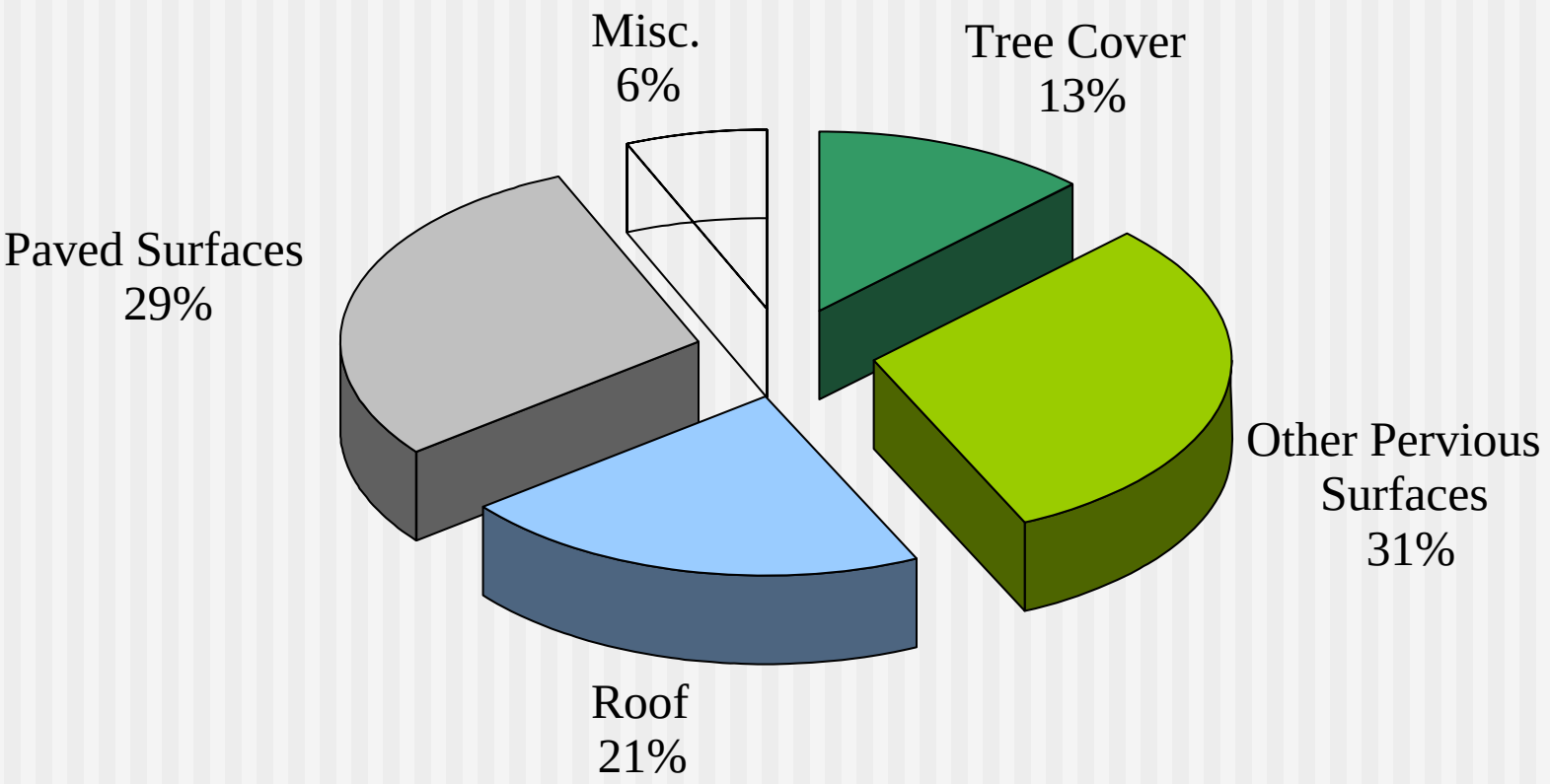
- Urban Heat Island Modeling Completed
  - Increased temperatures due to land cover changes
  - Increased ozone due to land cover changes
- State Legislation - Two Bills
  - Requiring TCEQ to identify emission credits for urban heat island programs for Houston region
  - Utility legislation for cool roofs
  - Utility legislation for shade trees
- Carbon Sequestration/Forestation Conference
  - Business community leadership


X27-X26
CAMx_O3
0.010
0.005
0.000
-0.005
-0.010
PPM
65
1
1
83
PAVE
by
MCNC
August 25,2000 0:00:00
Min=-0.004 at (21,30), Max= 0.008 at (31,32)


Hot roofs costing taxpayers $ in these 3 schools
Heat from roof and paving
Heat from shopping center affecting neighborhood

Houston's Urban Fabric

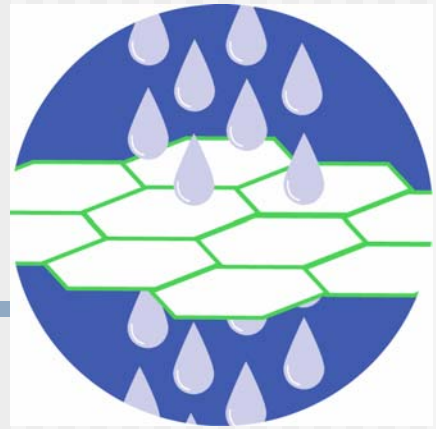
1,400 mi^2 Urban Fabric



Logic of Cool Houston Plan

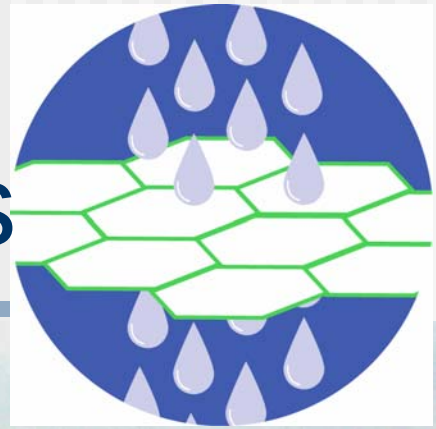
1. Surfaces most susceptible to change
2. Target decision makers
3. Actions affecting massive, but incremental changes
4. Targeting control points

Cool Paving

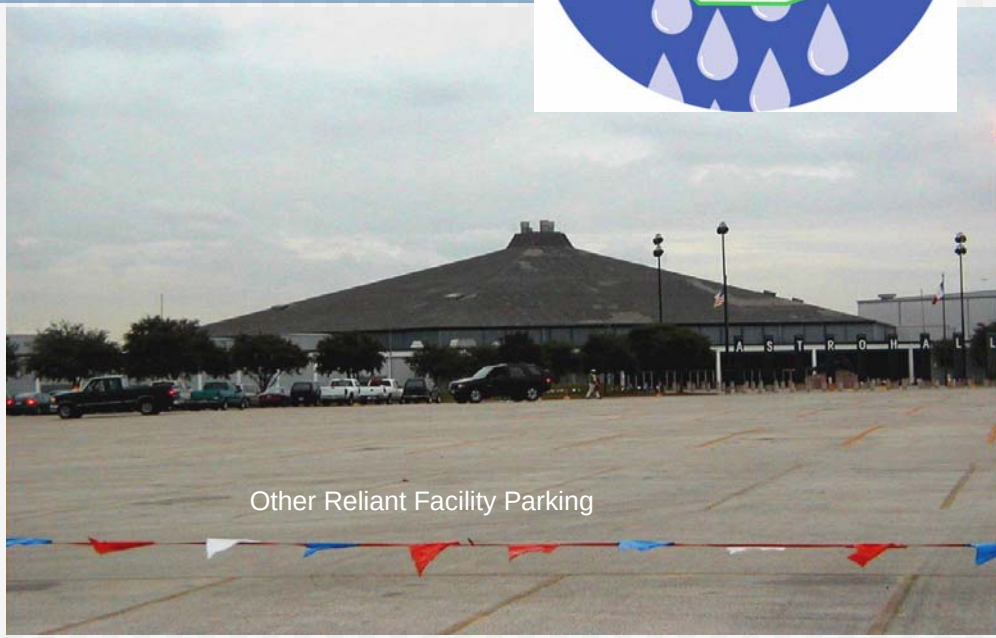


- Little interest in surface reflectivity by decision makers
  - Public works officials
  - Transportation planners
  - Building owners
- Public versus private surfaces
- State versus local surfaces

Understanding Surfaces

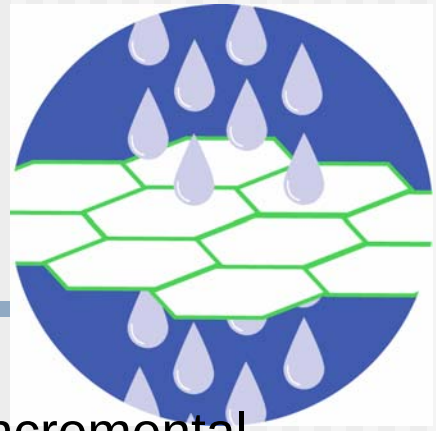


- Well-constructed residential streets not resurfaced or replaced in 15 to 35 years
- Highways and urban arterials may be resurfaced/rebuilt in 10 to 15 year span
- Many parking lots resurfaced every 5 to 10 years.
- Driveways infrequently resurfaced/replaced.
- Sidewalks infrequently resurfaced/replaced.
- 60% of paved surfaces could change in10-year period.
- Reflectivity could be increased by 2.5 times current level.



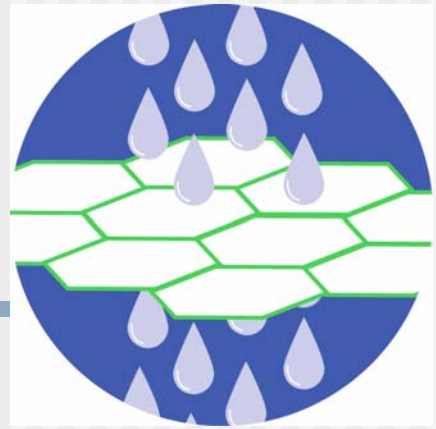
Other Reliant Facility Parking

Plan Logic - Paving



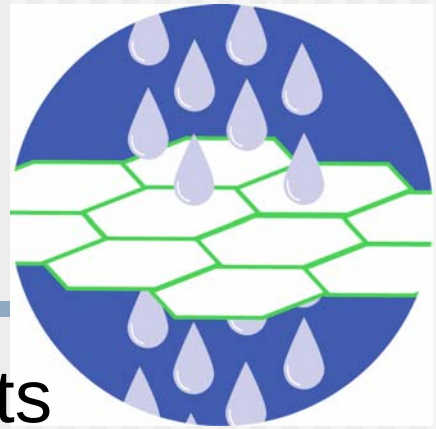
1. Areas most susceptible to change
   - Parking lots
   - New paved streets
2. Critical decision makers
   - Parking lots: owner/managers and paving companies. Price driven.
   - Roadways: government standards and practices.
3. Massive change in incremental, predictable ways
   - Over 10 years, new paved roadways account for 10% of all paved surfaces.
   - Parking surfaces are 60% paved surfaces; resurfaced every 5 to 10 years.
   - Maintenance opportunities on roadway resurfacing

Plan Logic - Paving



4. Control points
   - Parking lots
     - private building owners and managers + paving companies
     - local government parking lot requirements
   - New roadways
     - Local government standards and practices – public works departments
     - State government standards and practices – State DOT

Cool Paving Strategy



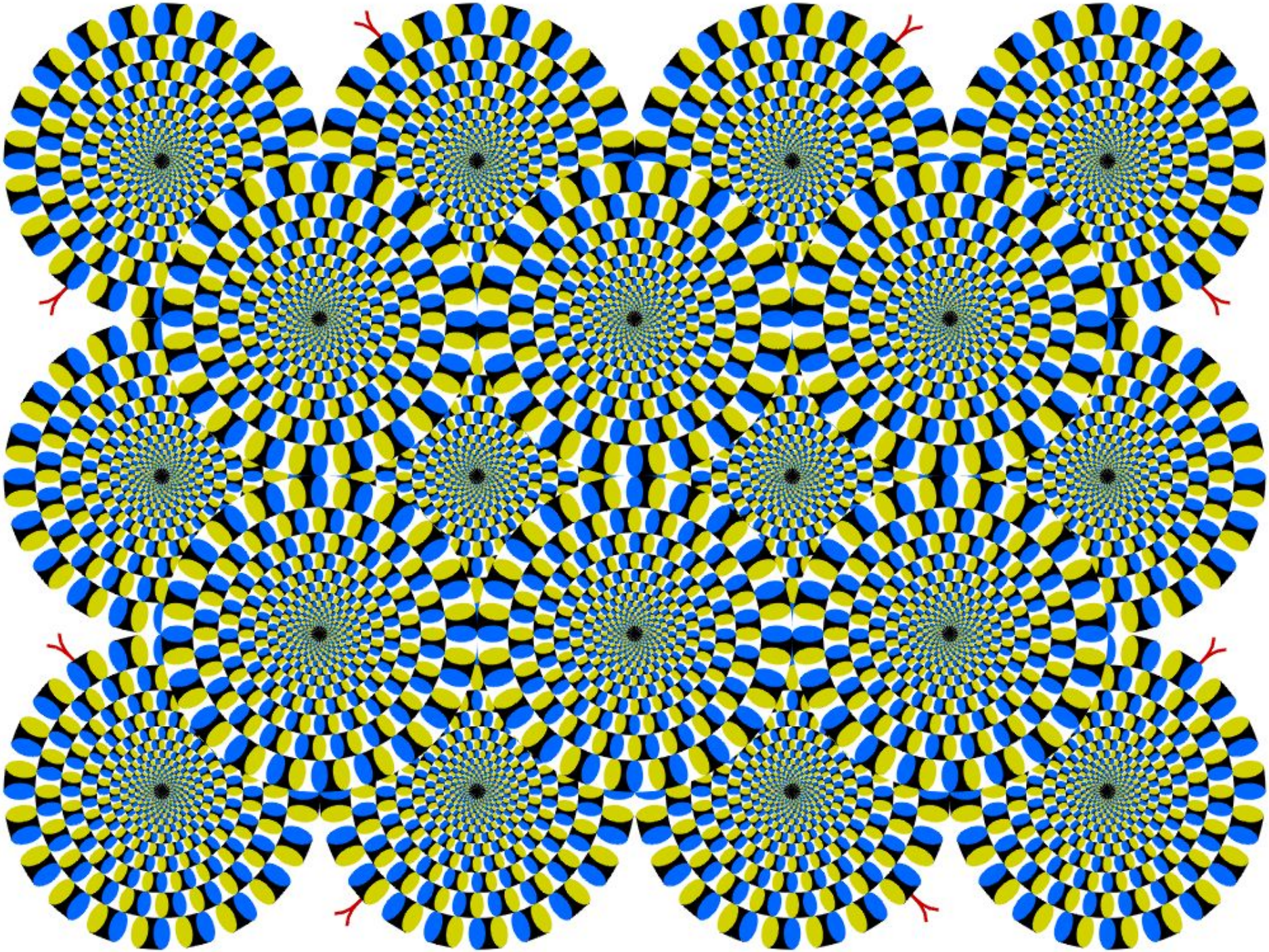
- Target paving areas and new streets
- Maintenance of shoulders, etc.
- Product awareness for owners, developers, and paving companies through organizations and individual companies
- Regulatory change for parking lots + shade trees in parking areas
- Include reflectivity in material specs

Combined Shade -Water -Parking


Trees are eliminated
from roadsides
as development occurs.

Conclusions

- There are systematic, cost effective actions to alter an urban fabric.
- Heat island mitigation components, such as cool roofing and trees, provide a stream of benefits than could be tapped to change an urban climate.
- The scope and amount of time required for such changes is as short as 10 years.
- Focus and continuity of effort are essential to achieve many of the strategies set forth here.



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